

COMPARATIVE STUDY ON THE MOSQUITO REPELLENT PROPERTIES OF LEMONGRASS, BASIL, AND LEMONSITO LEAF EXTRACTS

¹Candog, Rhiane T.; ²Abo-abo, Leann T.; ³Sabsal, Charline P.; ⁴Libardo, Janine E.;
⁵Rose, Victor P.; ⁶Manliguez, James B.

^{1,2,3,4,5,6} Oy National High School, Loboc, Bohol, Philippines

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Abstract: This study aimed to produce and compare the mosquito repellent properties of lemongrass (*Cymbopogon citratus*), basil (*Ocimum basilicum*), and lemonsito (*Citrus macrocarpa*) leaf extracts against *Culex pipiens* mosquitoes. The research utilized an experimental-comparative design conducted under controlled laboratory conditions. The plant leaves were extracted using 95% ethyl alcohol through maceration and prepared into spray solutions at concentrations of 5%, 10%, and 15%, with distilled water (0%) as the control. Repellent effectiveness was measured through the percentage of mosquito displacement. Results showed that all extracts exhibited repellent properties, with increasing effectiveness at higher concentrations. At 15% concentration, lemongrass recorded the highest displacement (86.67%), followed by lemonsito (83.33%) and basil (76.67%). Based on the average displacement, lemongrass ranked first (74.45%), lemonsito second (72.22%), and basil third (67.78%). The findings indicate that lemongrass extract is the most effective natural mosquito repellent among the three. The study concludes that plant-based repellents, particularly lemongrass, can serve as safe, affordable, and eco-friendly alternatives to synthetic chemical repellents.

Keywords: Lemongrass extract, basil extract, lemonsito extract, mosquito repellent, *Culex pipiens*, plant-based repellent, mosquito displacement.

I. INTRODUCTION

Mosquito-borne diseases such as dengue, malaria, and chikungunya remain serious public health concerns, particularly in tropical countries like the Philippines. These diseases are transmitted through mosquito bites, making prevention strategies essential. One of the most common protective measures is the use of mosquito repellents. However, commercial repellents often contain synthetic chemicals such as DEET and allethrin, which may cause health and environmental concerns with prolonged use. Due to these risks, there is increasing interest in natural alternatives. Plant-based repellents are considered safer and environmentally friendly, as they contain bioactive compounds that naturally repel insects. Lemongrass contains citral, basil contains eugenol and linalool, and lemonsito contains limonene—compounds known for their insect-repelling properties.

II. METHODOLOGY

This study employed an experimental-comparative research design to evaluate the effectiveness of three plant extracts as mosquito repellents. Fresh leaves of lemongrass, basil, and lemonsito were collected and processed through maceration using 95% ethyl alcohol. Extracts were diluted into 5%, 10%, and 15% concentrations, with distilled water as control.

Mosquitoes (*Culex pipiens*) were tested using a controlled tube assay setup. Data were gathered through mosquito displacement percentage and analyzed using mean and percentage.

III. RESULTS AND DISCUSSION

Results showed that all extracts had repellent properties. At 5%, all had 60% displacement. At 10%, lemongrass had 76.67%, lemonsito 73.33%, basil 66.67%. At 15%, lemongrass had 86.67%, lemonsito 83.33%, basil 76.67%. Lemongrass ranked highest overall, followed by lemonsito and basil. Increased concentration improved effectiveness.

IV. CONCLUSION

Lemongrass extract is the most effective natural mosquito repellent, followed by lemonsito and basil. The 15% concentration is the most effective. Plant-based repellents are safe, affordable, and eco-friendly alternatives to chemical repellents.

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